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ABSTRACT

This final report describes the activities and outcomes of a project designed to develop and establish a psychoeducational assessment model to enhance the ability of educators, psychologists, and learning specialists to design and conduct meaningful evaluations of students who are deaf-blind. By focusing on psychoeducational assessment, this project sought to address several longstanding concerns, including the absence of uniform guidelines for evaluation, the lack of field-based training materials and resources on the process of assessment, the shortage of evaluation personnel who are familiar with specific issues of deaf-blindness, and the problem of accurately characterizing the abilities and growth of individuals for whom standard models and techniques of assessment are likely to be inappropriate. Major outcomes of the project included the development of: (1) a pragmatic model of psychoeducational assessment for school-based practitioners working in diverse settings, including a process to assist state and multi-state projects to implement "train-the-trainer" models of personnel preparation; (2) materials and resources to support self-study or inservice models of personnel preparation; and (3) a communication assessment protocol to improve competencies of practitioners to describe communication and social interaction behaviors of students with deaf-blindness. (Contains 28 references.) (CR)

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Psychoeducational Assessment of Students who are Deaf-Blind: A Decision-Making Model for School-Based Practitioners

FINAL REPORT

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Psychoeducational Assessment of Students who are Deaf-Blind:

A Decision-Making Model for School-Based Practitioners

FINAL REPORT

I. Importance and Impact

A. Background

Numerous long-standing concerns among psychologists, educational evaluators, and learning specialists exist regarding the psychoeducational assessment of students who are deaf-blind. Among these are the absence of uniform guidelines of evaluation, the lack of field-based training materials and resources on the process of assessment, the shortage of evaluation personnel who are familiar with specific issues of deaf-blindness, and the problem of accurately characterizing the abilities and growth of individuals for whom standard models and techniques of assessment are likely to be inappropriate. It has also been noted that the instruments most commonly used in the assessment of individuals with deaf-blindness (see Popoff, 1985) were not designed for such application, as most of these instruments assume the presence of speech and normal auditory and visual processing capabilities. In fact, until the mid-1970s, there were no psychological or psychoeducational tests designed specifically for use with deaf-blind students, or even suitable adaptations of available instruments (Vernon, 1987).

In an effort to address these persistent concerns, several strands of research, development, and demonstration have recently focused on specific issues in the education and assessment of students with deaf-blindness, including: (a) the development of psychoeducational assessment tools; (b) the emphasis on communication assessment and intervention strategies; and (c) the dearth of professionals with experience working with individuals who are deaf-blind.

Psychoeducational assessment instruments. While some developmentally-oriented assessment tools have been produced over the past 20 years, most of these review students'

competencies in certain skill domains. The best known of the specially devised assessment tools is the Callier-Azusa Scale (Stillman, 1975). Not only does this instrument provide a framework for reviewing the perceptual, cognitive, communicative, motor, and social abilities of deaf-blind students, but it represents a departure from the more traditional evaluation models in which a child's skills and competencies were assessed with tests standardized on hearing-sighted children, regardless of the nature and extent of the child's disabilities. Further, the Callier-Azusa Scale, which is still commonly used, emphasizes a child's quality of achievements along certain continua of skill development, rather than test scores or the "correctness" of responses. Other existing instruments have been applied to the observation and assessment of children with deaf-blindness, as well. Schein, Kates, Wolf, and Theil (1983) developed the Assessment-Intervention Model for Deaf-Blind Students (AIM), which reviews achievement in specific daily-living domains. Similarly, Collins and Rudolph (1975) developed an observational tool to assess personal, social, motor, communication, cognitive, and sensory skills based on the ability profiles of a large sample of deaf-blind students.

Central role of communication in assessment. Within the field of developmental linguistics, a shift in emphasis from the study of the structure of language to pragmatics (McLean & Snyder-McLean, 1988) inspired research on nonspeech forms of communication, opening a path to intervention studies, as well as methods to assess communication and social interaction skills. Rowland and Stremel-Campbell (1987) proposed a sequence of the development of communicative competence of students with dual sensory impairments in which very basic behavioral forms, such as reactions to social or physical stimuli, were included in the spectrum of potentially communicative behaviors. Stillman (1978) developed a version of the Callier-Azusa Scale to assess communication skills of students with deaf-blindness. Other tools included the Communication Matrix (Rowland, 1990) and the Profiles of Expressive Communication and Social Interaction (Mar & Sall, 1990), both of which represented efforts to translate sequences of communicative competence, as conceptualized by Rowland and Stremel-Campbell, into observational protocols. The development of these instruments served to emphasize that

assessment of cognitive, academic, adaptive, and social skills could not be separated, theoretically or in practice, from analysis of communication behaviors, and that assessment of the "domain" of communication of students with deaf-blindness was, therefore, a multidisciplinary responsibility (Mar, 1995).

Personnel preparation needs. Approaching the concern from a different perspective, Vernon (1976) called attention to problems specifically in the psychological evaluation of deaf-blind children and youth. Vernon and his colleagues (Sullivan & Vernon, 1979; Vernon, Bair, & Lotz, 1979; Vernon & Green, 1980) argued that in order for evaluators to conduct meaningful and valid assessments, it was imperative that they be at least familiar with alternative means of communication. In support of these concerns, Vernon reported that tests administered to students with hearing impairments by inexperienced psychologists very often resulted in major errors of consequence. These authors cautioned that students who were deaf-blind were especially vulnerable to misdiagnoses of mental illness and mental retardation, as a result of evaluators' lack of understanding of students' communication skills and general behaviors. Their concern was that deaf-blind students would be inappropriately served in educational programs designed primarily for students with mental retardation, severe emotional disturbance, or other disabilities. The authors' proposal that deaf-blind individuals be brought to particular deaf-blind centers for evaluation (Vernon & Green) was not especially a drastic one at the time, given the scarcity of psychologists with exposure to deaf-blindness outside of these centers.

Most professionals who conduct psychoeducational assessments of students with deaf-blindness receive their training on the job, in special workshops, or as the occasion arises. Although some have interests or skills in sign language, sensory impairments, and communication enhancement, most of these evaluators are based in schools or agencies serving individuals with sensory impairments. Increasingly, however, students with deaf-blindness are being educated in their own community schools where psychologists may not be as familiar with issues of deaf-blindness. It has been recently estimated that more than 80% of youngsters who are deaf-blind are being educated in local schools (McLetchie, 1995). Indeed, several investigators have

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documented that psychologists, educational evaluators, and other assessment personnel are well cognizant of their need for information and training on assessment of students with deaf-blindness and other severe disabilities. Popoff (1985) noted that many of the respondents to her survey of 36 psychologists expressed frustration in not being able to adequately evaluate the competencies and needs of the deaf-blind individuals they served. Popoff's analyses of the wide range of assessment strategies that the respondents typically utilized suggested that there were few, if any, common guidelines or standards of evaluation. In fact, several respondents specifically remarked upon the subjectivity of evaluation procedures and the lack of graduate school programs focusing on low-incidence populations. Irons, Irons, and Maddux (1984) surveyed 285 assessment personnel, over half of whom perceived that they lacked competencies to evaluate students with severe disabilities. Mar (1991) reported that even psychoeducational evaluators who had more than ten years of experience working with students with severe disabilities, including deaf-blindness, tended to feel inadequate and insecure evaluating such students.

B. The Complexity of Psychoeducational Assessment Needs and Issues

As a result of the numerous federal initiatives focusing on the education and assessment of individuals who are deaf-blind, there have been significant advances in our understanding of, for example, nonsymbolic forms of communication (e.g., Rowland & Stremel-Campbell, 1987), applications of augmentative and assistive technologies to enhance communication and social skills (e.g., Goldstein, 1993; Mar & Sall, 1994; Rowland & Schweigert, 1991), means to address challenging behaviors through educative approaches (e.g., Billingsley, Huven, & Romer, 1995), and methods to promote independence and self-determination (Adams, 1993). In addition, an ever-growing number of deaf-blind students are enrolled in general, as opposed to specialized, schools and classrooms (Riggio, 1993), where issues of social interactions and peer relations are often primary educational concerns (Haring, Haring, Breen, Romer, & White, 1995; Mar & Sall, 1995).

Consequent to these and other developments, the training needs of school-based practitioners who are responsible for evaluating deaf-blind students have become much more extensive in several respects. Evaluators must: (1) learn to relate their assessments to current effective practices in the education of students who are deaf-blind and, correspondingly, to utilize the available theoretical and technical knowledge to design meaningful evaluations; (2) be prepared to understand the communication and social interaction behaviors and opportunities of students who are deaf-blind, as these are integral to all academic and social skill areas; and (3) attempt to examine the complex, dynamic relationship between the individual and his or her physical and social environment, as different contexts of learning and socialization, such as inclusive education programs, may affect evaluation outcomes.

However, in the absence of a validated psychoeducational assessment model that can provide guidelines for assessment design, evaluations of deaf-blind children continue to be subject to a host of significant problems and concerns often cited in the literature. These issues include an arbitrariness in the selection of evaluation procedures and instruments (e.g., Popoff, 1985), misdiagnoses (Vernon, 1987), bias and discrimination in assessment results (Sigafoos, Cole, & McQuarter, 1987), irrelevance of findings to educational goals and teaching (Evans, 1991; Mar, 1991), inconsistencies or contradictions in planning a student's educational program and supports (Mar, 1995), failure to identify a student's full range of competencies and abilities (Langley, 1986), and misinterpretation of communicative behaviors (Carr & Durand, 1985).

Several evaluation and educational planning instruments have been designed for use with students who are deaf-blind. Some of these are specialized tools (e.g., AIM, Callier-Azusa Scale) that provide structure and organization to the gathering of information about a student's competencies in certain skill domains (Schein, Kates, Wolf, & Theil, 1983; Stillman, 1975). Others (e.g., COACH) help educational teams to identify the content of a student's educational program and to project learning outcomes in general school settings (Giangreco, Cloninger, & Iverson, 1993). However, there exists no model or approach to psychoeducational assessment of students who are deaf-blind that:

(a) serves as a conceptual framework which defines a process for the planning of valid and reliable assessments;

(b) systematically recognizes and takes into account the extreme heterogeneity of this group of students in terms of their communicative, sensory, physical, cognitive, social, academic, behavioral/emotional, and adaptive skills;

(c) specifically emphasizes the importance of the relationship between a student's unique forms and patterns of communication and interaction to educational issues, goals, curricula, and interventions;

(d) considers the relevance and irrelevance of particular assessment strategies, methods, and tools, given a student's broad profile of communicative and social competence;

(e) is designed for school-based practitioners-- versus center-based specialists-- for use in diverse educational settings and programs in which students who are deaf-blind are being served, including neighborhood schools;

(f) helps the evaluator view assessment issues from a transdisciplinary or interdisciplinary perspective; and,

(g) considers the impact of environmental or contextual factors, such as peer involvement, availability of resources, and school setting, on an individual's skills and behaviors as part of the evaluation design.

In seeking to develop and validate such a model, along with material resources for the training and support of evaluation personnel, this project recognized that the process of psychoeducational assessment has only become more, not less, complex as a result of changing educational practices and increased knowledge in the area of deaf-blindness.

The purpose of this demonstration project was to develop and establish a psychoeducational assessment model to enhance the ability of educators, psychologists, and learning specialists to design and conduct meaningful evaluations of students who are deaf-blind. By focusing on psychoeducational assessment, this project sought to address several long-

standing concerns. These included: the absence of uniform guidelines of evaluation; the lack of field-based training materials and resources on the process of assessment; the shortage of evaluation personnel who are familiar with specific issues of deaf-blindness; and the problem of accurately characterizing the abilities and growth of individuals for whom standard models and techniques of assessment are likely to be inappropriate.

C. Major Outcomes

Major outcomes of this project included the development of: (1) a pragmatic model of psychoeducational assessment for school-based practitioners working in diverse settings, including a process to assist state and multistate 307.11 projects to implement "train-the-trainer" models of personnel preparation; (2) materials and resources to support self-study or inservice models of personnel preparation; and, (3) a communication assessment protocol to improve competencies of practitioners to describe communication and social interaction behaviors of students with deaf-blindness. These are described in detail under the section entitled Objectives and Activities. Articles and other written materials and resources are included in the Appendices.

This project represented a collaboration among the Developmental Disabilities Center of St. Luke's-Roosevelt Hospital Center, the Center for Opportunities and Outcomes of Teachers College, Columbia University, and projects on deaf-blindness (307.11) in the states of New York, Indiana, Maryland, and Washington. Approximately 30 practitioners and students with deaf-blindness were involved in the expansion of the observational protocol and the validation of the decision-making sequence. Students with deaf-blindness represented a diverse population in terms of their ages, communication skills, cognitive abilities, educational programs, and ethnic and cultural backgrounds.

A Model of Psychoeducational Assessment. The psychoeducational assessment model developed by this project was designed as a "decision-making sequence" to help school-based practitioners: (a) describe and characterize communication and social interaction behaviors of students who are deaf-blind; (b) apply a logical process to identify the critical skill areas and

educational issues that need to be addressed; (c) consider appropriate assessment approaches and methods to address the unique needs and concerns of individual students with deaf-blindness; (d) relate potential observations and results to appropriate educational priorities; and (e) understand how the results of assessment contribute to team evaluations. The model was based upon existing and ongoing foundational work in the area of assessment and communication, particularly the study and delineation of sequences of communicative competence among students who are deaf-blind (Mar & Sall, 1990; Rowland, 1990; Rowland & Stremel-Campbell, 1987; Stremel & Schutz, 1995). The model is not designed to dictate a particular method or set of procedures and instruments for the evaluator to utilize but, rather, to suggest critical questions, issues, and concerns that need to be reviewed and help to evaluator identify appropriate assessment approaches, procedures, and instruments.

The need for this comprehensive model of assessment grew out of numerous concerns, problems, and issues identified in the literature and discussed above. Specific issues related to this model are summarized in Table 1, Critical Needs and Issues Regarding Evaluation Practices. The model developed by this project emphasizes a "contextual" approach to evaluation in which an individual's skills and behaviors are examined in the context of meaningful interactions and experiences. This approach recognizes that environmental factors are as important to assess as the individual's competencies, and that interventions must take into consideration those elements of both physical and social environments (e.g., peer interactions, type of activity) that may impact upon one's skills.

II. Objectives and Activities

The major objectives and activities are presented in detail below, and elaborate how the project specifically addressed the unique concerns associated with the evaluation of students who are deaf-blind. Activities under Objectives 1 and 2, including the development and expansion of observation and evaluation protocols, were conducted primarily during Year I and II of the project.

Table 1.

Critical Needs and Issues Regarding Evaluation Practices

Critical Need	Rationale
1. Development of a comprehensive protocol to assess the communication and social interaction skills of students with deaf-blindness.	1. Evaluators need a tool that can help them better analyze and understand the breadth, forms, qualities, and complexity of an individual's communication behaviors. This information is prerequisite to the understanding and assessment of academic, social, cognitive, adaptive, and behavioral concerns, and is, therefore, especially relevant to the design of psychoeducational assessments. Because communication is often the most critical concern in the educational plan of students who are deaf-blind, its analysis is an integral component to psychoeducational assessment. Within this model of assessment, sequences, levels, or profiles of communicative and social competence are related to intervention goals and strategies.
2. Development and validation of a process that permits evaluators to: (a) make decisions about relevant assessment issues, evaluation instruments, and the applicability	2. Although there are assessment tools that can be utilized to evaluate students with deaf-blindness, there continue to be no basic standards and guidelines of assessment. A model is needed that provides some validity to the evaluation process, i.e., such that two practitioners who independently design evaluations of

Critical Need	Rationale
of particular assessment strategies (e.g., psychometric testing vs. functional or ecological procedures); and, (b) to help practitioners relate observations and findings to specific issues of deaf-blindness.	the same student with deaf-blindness each identify the most salient educational issues, develop comparable procedures, be consistent in the selection of assessment approaches, and similarly understand the significance of assessment results with respect to the student's achievements, goals, and needs. Because people who are deaf-blind are so diverse with respect to their sensory capabilities, learning and communication skills, interests, education, and experiences, there is no singular "best" approach to psychoeducational evaluation. However, it is important for the evaluator to be able to identify and utilize that approach or combination of approaches which address the primary issues of concern. Approaches that are typically employed in psychoeducational assessment of students with deaf-blindness include: the psychometric approach; developmental assessment; the functional (or ecological) approach; and behavioral assessment. Often, psychological evaluations of students who are deaf-blind involve the use of more than one approach because the educational and social concerns are so complex. Yet, practitioners must rely on their own experiences-- and biases-- in how assessments are designed. This model of assessment integrates current knowledge and best practices, and helps the practitioner interpret results in terms

Critical Need	Rationale
	of specific issues related to deaf-blindness (e.g., relate findings about spatial concepts to issues of orientation and mobility, or analyses of matching abilities to symbol use in communication).
3. Development of training materials and resources to support school-based practitioners.	3. While recent developments in psychoeducational assessment have been made, including the publication of several books, articles, and other general resources, these have not been created specifically as training resources for individual practitioners in the field. Such materials are critical, since: (a) other forms of training support, such as inservice workshops and training institutes, are infrequent, limited in scope, and tend to have short-lived impact; and (b) there is a high turnover of trained personnel and an increasing shortage of professionals in the area of deaf-blindness relative to the expanding need (McLetchie, 1993). Related, there is also a need for materials that also support "train-the-trainer," self-study, or self-review models of personnel development. Materials designed for independent use or as part of inservice or mentorship training programs provide more efficacious means to support the ongoing needs of practitioners.

Critical Need	Rationale
4. Development of a protocol to enable practitioners to evaluate the dynamic role of environmental and cross-context variables on student competencies and behaviors.	4. Educational programs for children and youth with deaf-blindness have become increasingly diverse in terms of school settings. Yet, although an increasing number of deaf-blind students are being educated in inclusive programs within their neighborhood schools, psychoeducational assessment models have not changed or advanced to evaluate how these social contexts affect students' abilities, motivation, difficulties, opportunities, and interests. Psychoeducational assessments, particularly those involving the use of formal tests, are often conducted in vacuums such that analyses of cognitive, communicative, and adaptive skills are not meaningfully related to the academic and social contexts in which the skills are required. Further, even though functional assessments, which have been emphasized over the past 15 years as the more appropriate approach for evaluating individuals with severe disabilities, tend to yield more ecologically valid results, they do not necessarily examine the effects of contextual factors on an individual's behaviors and performance. The practitioner's ability to assess environmental factors and describe a student's competencies as a partial function of these factors (e.g., integrated activities, cooperative learning) must be considered an essential component of a comprehensive psychoeducational evaluation.

Critical Need	Rationale
5. Emphasize an interdisciplinary and transdisciplinary process to help evaluators consider the specific implications of their assessments and findings related to other disciplines and service providers.	5. Recently there has been an increased emphasis on team evaluations and the importance of maintaining an interdisciplinary perspective, particularly in the evaluation of students who are deaf-blind where issues of cognitive, academic, social, communicative, adaptive, and sensorimotor abilities are intertwined. However, in the evaluation of individuals with complex educational needs, specific responsibilities of individual team members can become indistinct, poorly conceptualized, or inadequately defined. A model of psychoeducational assessment should help the evaluator understand his or her potential roles and responsibilities in relationship to those of other team members in the process of educational planning for deaf-blind students with heterogeneous skills and needs.

Validation of materials and the psychoeducational assessment model, Objectives 3 and 4, constituted the predominate activities during Year II and continued through Year III. Collaboration with state deaf-blind projects for purposes of demonstrating a model of technical assistance, Objective 5, occurred continuously throughout the project period. Table 2 presents a timeline of specific project activities. In addition, various forms and materials were developed by this project for the purpose of conducting psychoeducational assessments. These instruments are presented in the Appendices of this report.

Objective 1. To expand existing protocols to help evaluators observe and accurately describe the forms, breadth, and patterns of communicative and social interaction skills of individuals who are deaf-blind. There are several communication assessment protocols that can be used with students who are deaf-blind (Mar, 1995), but few of these guide the evaluator to consider how findings relate to specific interventions. The major aim of this objective was to expand and revise an existing assessment protocol previously developed by members of this project. The result is an instrument which can provide evaluators with a means for understanding the complexity of communicative forms, behaviors, and competencies specifically among students who are deaf-blind. The psychoeducational assessment model developed by this project requires that a practitioner be able to analyze and accurately characterize a student's communication and interaction skills. This is regarded as a critical foundation in the design of an evaluation plan, and the information can be used in several important ways, including: the selection of an evaluation approach, such as the use of formal, developmental, behavioral, and functional methods; the identification of critical educational and social issues and concerns; the consideration of specific assessment tools; and the review and planning of educational needs, supports, and interventions. General activities included revision and expansion of the Profiles of Expressive Communication and Social Interaction (Mar & Sall, 1990), field-testing of the instrument, and development of supportive materials for application by practitioners who serve students with deaf-blindness.

Specific activities. Activities under Objective 1 included revision and expansion of an existing measure, Profiles of Expressive Communication and Social Interaction (Mar & Sall,

Table 2. Timeline for Objectives and Activities

	Year 1 Month 1 3 6 9	Year 2 Month 1 3 6 9	Year 3 Month 1 3 6 9
Objective 1. To expand existing protocols to help evaluators observe and accurately describe the forms, breadth, and patterns of communicative and social interaction skills of individuals who are deaf-blind.			
Activity 1.1 Review existing data on Profiles of Expressive Communication and Social Interaction.	x---------x		
Activity 1.2 Review and compile professional literature and assessment materials on communication behaviors of children with deaf-blindness to incorporate into revised Profiles.	x---------x		
Activity 1.3 Expand and revise Profiles of Expressive Communication and Social Interaction	x---------x		
Activity 1.4 Identify 10 to 15 students to participate in assessment activities, secure parental permissions, and establish a "data base" for each student.	x------x		
Activity 1.5 Design and develop processes and methodologies for conducting observational research.	x----------x		
Activity 1.6 Field-test and validate assessment protocol.	x----------x		
Activity 1.7 Analyze the communicative and social interactive behaviors and competencies of students.	x----------x		
Activity 1.8 Contact project consultants and experts in field of deaf-blindness to review and critique protocol.	x----------x		
Activity 1.9 Incorporate comments into final version of assessment protocol.		x------x	
Objective 2. To develop a "decision-making sequence" that utilizes information obtained with these protocols and other relevant information to identify critical educational issues, relevant skills to assess and the contexts in which to assess them, appropriate methodologies, and available assessment tools.			
Activity 2.1 Design protocol for collecting background information on students, including previously administered assessments and evaluations.	x----------x		
Activity 2.2 Review, select, and/or adapt effective approaches and measures for use during assessment in natural contexts.	x----------x		

Activity 2.3 Generate range of assessment concerns and potential evaluation barriers.

Activity 2.4 Identify skill categories and critical educational issues for students with range of communication and interaction behaviors.

Activity 2.5 Formulate range of communication and interaction goals for consideration in addressing individual educational issues and needs.

Activity 2.6 Organize all factors affecting assessment into cohesive decision-making sequence.

Objective 3. To develop professional training materials and resources on psychoeducational assessment of students with deaf-blindness. .

Activity 3.1 Identify relevant training materials for practitioners responsible for conducting assessment.

Activity 3.2 Prepare and develop written resources and reference materials for assessment of students who are deaf-blind.

Activity 3.3 Design and develop self-study training materials relating to decision-making sequence.

Activity 3.4 Prepare and develop videotape vignettes of assessment based upon decision-making sequence.

Activity 3.5 Organize materials into an inservice training or self-study "curriculum" package.

Activity 3.6 Evaluate effectiveness of self-study training materials and resources.

Activity 3.7 Revise self-study training materials and resources based on comments from professionals.

Objective 4. To validate the decision-making model of psychoeducational assessment by applying it to the evaluation of a heterogeneous sample of students who are deaf-blind.

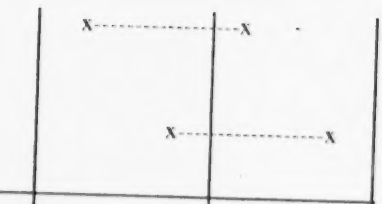
Activity 4.1 Collaborate with state agencies and programs to identify 10 to 15 students from New York, Maryland, Indiana, and Washington to participate in validation study.

Activity 4.2 Identify 15 to 20 evaluation personnel (psychologist, educational evaluators, etc.) to participate in field-testing and validation.

Activity 4.3 Conduct psychoeducational assessment of students using decision-making sequence.

Activity 4.4 Conduct data analysis on field-test evaluations and compare results for purpose of validity and interrater reliability.

Activity 4.5 Revise decision-making sequence based on outcome of field-test data.



Objective 5. To demonstrate a model for state deaf-blind projects to support the training and informational needs of personnel involved in the psychoeducational assessment of students with deaf-blindness.

Activity 5.1 Collaborate with state deaf-blind projects (New York, Maryland, Indiana, and Washington) to provide technical assistance to agencies and schools through the use of resource materials.

Activity 5.2 Prepare technical assistance and support materials for state deaf-blind projects, agencies and school programs.

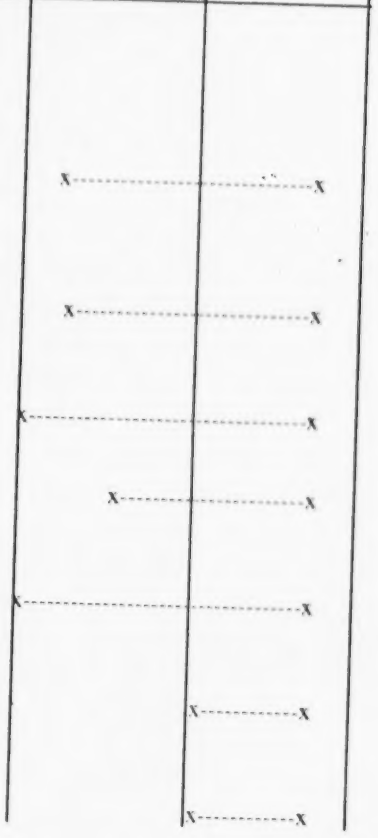
Activity 5.3 Plan and participate in inservice training activities.

Activity 5.4 Evaluate the technical assistance and support materials based on utility of model, values of resources, and generalizability of model.

Activity 5.5 Disseminate decision-making model, materials, and resources pertaining to the psycho-educational assessment of students who are deaf-blind.

Activity 5.6 Prepare professional articles and papers on models of psychoeducational assessment for students with deaf-blindness.

Activity 5.7 Participate in national conference.



1990), for use with students who are deaf-blind. This protocol was initially designed as an observational tool to assist educators in considering appropriate goals that can enhance the intentional expressive communication behaviors of individuals with severe disabilities. The Profiles of Expressive Communication and Social Interaction were originally developed for a project focusing on the communicative skills of students with disabilities, and data from over 125 students with severe disabilities ranging in age from 3 through 21 were collected and analyzed. This large sample of students included over 25 individuals with deaf-blindness. The protocol characterized communication according to several qualitative features, including degree of intentionality of expressive behaviors, complexity, use of symbols, ability to initiate interactions, understanding of social processes (e.g., give-and-take during conversation), and conventionality of expressive forms. Data from these protocols were used to generate extensive profiles of individuals' communication patterns. In the original version of this instrument, seven general profiles (I to VII) of communicative competence were summarized, each of which were then related to an outline of potentially appropriate educational goals and intervention strategies. One of the first activities of this project was to re-analyze the existing data on these individuals and revise the protocol to more specifically describe the breadth and complexity of expressive communication and social behaviors among students with deaf-blindness. One outcome of this analysis was the development of an article which summarized the original research methods and data. Published in the journal Education and Training in Mental Retardation, the article, "Profiles of the Expressive Communication Skills of Children and Adolescents with Severe Cognitive Disabilities," appears in Appendix A. Additional revisions to the protocol included a greater emphasis on the analysis of receptive language and communication skills, given the diverse forms of receptive communication within the population.

Following the initial revision, the protocol was field tested by a group of 28 graduate students from Teachers College, Columbia University. The students were enrolled in a Master's level course on assessment and evaluation of school-age students with disabilities. Field testing was conducted in the greater New York metropolitan area during March and April, 1997. School-

age students with disabilities who were assessed during the field test represented a heterogeneous group, based not only on their ethnic, cultural, religious, and socioeconomic backgrounds, but also on their degree of sensory impairment, communicative competencies and social behaviors, and school settings (e.g., specialized schools, general education classrooms). All respondents who administered the protocol were asked to complete a questionnaire as part of the field test. Comments from the questionnaire were then used to make further changes in the protocol. Following these changes, a new version of the instrument was sent to project consultants and a group of experts in the field of deaf-blindness and assessment. This group included faculty members of major universities with programs in special education, all of whom taught courses in the assessment of individuals with hearing and vision impairments, psychologists responsible for conducting assessments of students with deaf-blindness, and other project consultants and advisors. The group of experts was asked to provide specific comments regarding the instrument. These comments were also incorporated into a revised draft of the instrument.

The end product of this phase of the project was an instrument that evaluators can use to characterize communication behaviors. The revised instrument, Dimensions of Communication, Part I: Developing a Communication Profile, can stand alone as a tool for use by evaluators. It also represents the first component of the decision-making model. This part of the protocol is included in Appendix B.

Objective 2. To develop a "decision-making sequence" that utilizes information obtained with these protocols and other relevant information to identify critical educational issues, relevant skills to assess and the contexts in which to assess them, appropriate methodologies, and available assessment tools. The purpose of activities under this objective was to establish basic guidelines for the design of psychoeducational assessments of students who are deaf-blind. Currently, there exist only very general evaluation standards, which do not provide sufficient direction for most practitioners who evaluate students with deaf-blindness. As a result, designs of psychoeducational assessments are often arbitrary, subjective, and inconsequential to students' educational programs and needs. This project emphasized a logical process of evaluation design

in which the evaluator engages in: (a) analysis of communicative and social competence of the student as an initial basis for decision making; (b) identification and review of potentially useful strategies, methods, and tools of assessment; (c) systematic consideration of skill areas and competencies to be assessed in terms of relevance to a student's current educational issues and needs; and (d) review of how potential findings may be theoretically and pragmatically related to interventions and supports (e.g., understanding implications of cognitive abilities for communication enhancement). General activities included the development of written and videotape resource and demonstration materials for practitioners that guide them to review the spectrum of assessment-related concerns and questions for a heterogeneous group of students who are deaf-blind. The purpose of these activities was not to develop a "cookbook" approach to evaluation, but rather, to present a framework through which professionals can plan assessments that correspond to relevant educational goals of individuals who are deaf-blind.

Specific activities. The focus of activities under this objective was to develop a conceptual framework in which an evaluator is guided through a decision-making sequence, based upon background information and observations of the student being evaluated. The psychoeducational assessment model is defined as a process for the design of evaluations, involving a logical, decision-making sequence of activities consisting of: systematic review of background information; observations and analyses of communicative and social interaction skills; use of data to guide decisions regarding appropriate assessment issues and questions; consideration of specific educational issues and needs; assessment of the individual; and, analyses of findings in relation to identified needs and concerns. Thus, the central activity under this objective was the translation and articulation of the conceptual model into a cohesive sequence of steps to guide practitioners through the considerations and decisions that are required for meaningful psychoeducational assessments. Like the COACH (Giangreco et al., 1993), which elaborates a sequence of processes for the planning of educational content for students with severe disabilities in general education settings, this model specifically guides assessment design.

Initial activities focused on the development of a protocol for collecting data on students with deaf-blindness, including the design of observation and interview forms, as well as a recording form for conducting one-to-one interactions during an assessment. These forms were developed as a means to direct the evaluator in the collection of pertinent information. Once developed, all of the forms were sent to project consultants for comment. Based upon suggestions from the field, revisions were made, and the forms were finalized. The forms were compiled into a booklet, which serves as the Recording Booklet for the assessment protocol. The Recording Booklet was incorporated as a separate section at the end of the Dimensions assessment instrument (see Appendix B).

Concurrent with the design and development of data collection forms, existing assessment approaches and measures were reviewed. This led to the identification of specific skills critical to the assessment of students with deaf-blindness, such as symbolic representation or understanding of cause-effect relationships. Available evaluations, taken from a database of individuals with deaf-blindness, were also reviewed and numerous goals were generated relevant to enhancing communication skills. The purpose was to compile a comprehensive list of skill categories and educational interventions and goals that could be incorporated into the decision-making model. After undergoing several revisions and expert review, this list was organized and developed to serve as the second section of the assessment instrument, Dimensions of Communication. Part II of the Dimensions, Designing an Intervention Plan, appears in Appendix B following Part I of the protocol.

Objective 3. To develop professional training materials and resources on psychoeducational assessment of students with deaf-blindness. Assessment resources that are currently available and are appropriate for use with deaf-blind individuals vary greatly with regard to their intended population, professional orientation, recommended practices, and the general concept of psychoeducational evaluation. In addition, specific resource materials designed to support the needs of school-based practitioners responsible for conducting psychoeducational assessment are difficult, if not impossible, to obtain. General activities under this objective aimed

to fill the need for materials and resources on psychoeducational assessment. These activities involved the development of training materials, including written resources, reference and videotape materials, and evaluation materials based upon the decision-making model of assessment that this project developed. These materials emphasize the practitioner's need to consider a sequence of decisions about appropriate assessment methodology and instruments in relation to students' communicative and social competencies.

Specific activities. The development of assessment resources, including the identification of relevant training materials, preparation and development of written resources and reference materials, the development of videotapes, and an organized inservice training "curriculum" on psychoeducational assessment were the major focus under this objective. A three-part videotape was developed by this project. The target audience includes psychologists, educational evaluators, speech-language therapists, and/or educational specialists who are responsible for conducting psychoeducational assessments but who may not be familiar with the scope of issues facing individuals with deaf-blindness. The videotape aims to convey important messages, such as the concept that an individual's abilities should be assessed in the context of an activity and that contextual assessment is not only valid, but may prove more useful than traditional approaches for the individual with concomitant hearing and vision impairments. The videotapes were produced by Dr. Brent Bailey. Collaborative efforts in making the videotapes, including resources and footage for the videotapes were received from the Indiana Deaf-Blind Services Project at the Blumberg Center, Indiana State University. The first segment in the series is a 10-minute video titled, "A Parent Point of View," and contains footage from a parent panel convened for the purpose of discussing issues related to psychoeducational assessment of children with deaf-blindness. The second segment, "Assessing Children who are Deaf-Blind: Conducting a Contextual Approach," describes methodology and key points for practitioners. This segment runs for approximately 50 minutes. The third section, "Assessing Children who are Deaf-Blind: The Role of the Psychologist," focuses on the practitioner's need to understand and interpret the relationship between the environment, the student, and learning outcomes. This section

emphasizes that in order to conduct a meaningful contextual evaluation, the practitioner needs to examine four specific skill domains: cognitive skills, communication behaviors, social relationships, and adaptive abilities. A companion handbook was developed to highlight key concepts discussed in the videotapes. This handbook also aims to fill the need for self-study training materials. A copy of the handbook appears in Appendix C.

A second videotape was developed by this project to accompany the Dimensions of Communication assessment protocol. The Dimensions videotape describes the purpose of the assessment tool and serves as a visual descriptor of the six dimensions and levels of communication. Several different students who represent the heterogeneity of the deaf-blind population (e.g., in their communication, physical and cognitive skills) are highlighted on the videotape. This videotape is packaged together with the assessment manual. Dr. Brent Bailey was also involved in the production of this videotape.

Another major product developed by the project was a resource manual which rates, according to several criteria, assessment instruments used by practitioners in the evaluation of individuals with deaf-blindness. The overall purpose of the manual is to provide clear, practical, and straightforward information about specific assessment tools. The target audience for the manual is school psychologists and educators who are responsible for conducting psychoeducational evaluations. The process began with a broad examination of over 300 journal articles, chapters, and other printed materials pertaining to assessment of students with sensory impairments. This list was narrowed down to a more detailed and in-depth review of 60 pertinent materials. These materials are categorized into four discrete sections: General Development, Life Skills, Academics, and Communication/Social Interaction. A list of key concepts or critical factors was identified, including population, ease of use, cost/availability, adaptability, ecological validity, standardization, scoring, meaningful outcomes, and pre-requisites needed to administer the assessment instrument. Each of these factors were rated on a scale from 1 to 5, and a brief narrative was included in the rating for each assessment tool. The manual is similar to one developed by the Kansas State Department of Education in 1990. The project contacted Dr. Joan

Houghton, author of the manual and Project Director of the Kansas Deaf-Blind Project, to discuss the need for an updated and expanded manual. Through a collaborative process with the Kansas State Department of Education, an initial version of the manual was developed. A list of assessment criteria was developed and sent to a group of 9 experts in the field of deaf-blindness. Specific feedback was requested to help guide revisions of the manual. This new resource manual will help practitioners identify assessment tools, review their functions, consider their relevance, and obtain appropriate instruments (see Appendix D).

In addition to these materials, the project produced an article for Deaf-Blind Perspectives. This Research-to-Practice report focused on parent perspectives and concerns regarding psychoeducational assessment. A Fact Sheet for DB-LINK was also prepared, entitled, "Psychological Evaluation of Children who are Deaf-Blind: An Overview with Recommendations for Practice." The article appearing in Deaf-Blind Perspectives and the Fact Sheet can be found in Appendix E. In addition, three newsletters were developed during the project period which were disseminated to an extensive list of over 325 practitioners, family members, researchers, educators, and other persons involved in the education and assessment of individuals with deaf-blindness. These are included in Appendix F.

Objective 4. To validate the decision-making model of psychoeducational assessment by applying it to the evaluation of a heterogeneous sample of students who are deaf-blind. This objective pertained to field test activities in which the assessment model and materials developed by the project were applied by practitioners during evaluations of students with deaf-blindness. Validation activities specifically involved field testing the assessment protocol with a heterogeneous group of deaf-blind students who had diverse profiles of communicative and social competence. This sampling served to better define the processes and sets of decisions that evaluators must consider in designing and conducting evaluations, as well as to test the utility of the model (validation) by reviewing: (a) the usefulness of the protocol as identified by practitioners during field tests; and (b) the appropriateness of interventions related to students'

actual educational priorities. The application of the model to the evaluation of a sample of students also provided unique case scenarios for additional training materials.

Specific activities. The majority of activities under this objective focused on training workshops during which the decision-making model was presented to practitioners. In addition, the model was directly applied in the assessment of a sample of students with deaf-blindness. The Dimensions protocol was used in field test activities for training workshops conducted in Indiana, Kansas, Hawaii and South Carolina. Results of the evaluations conducted during field tests were compiled and used to examine specific issues and concerns related to assessment.

In collaboration with this project, the Indiana Deafblind Services Project developed a systems change inservice training model entitled PHASES, Psychologists Helping Assess Students' Educational Strengths. PHASES focus was on providing training and technical assistance to school psychologists, educators, families, university faculty, and other service providers regarding the assessment of students with deaf-blindness. The model included the development of a peer network of school psychologists regarding assessment concerns. PHASES training consisted of a total of five workshop days spread over a 5-month period with follow-up activities, and was offered to 25 participants identified by the Indiana Deafblind Services Project. In addition to the training activities, which were conducted by the Project Director, the project also disseminated resources and materials to practitioners involved in the workshops. PHASES grew out of a clear need and concern voiced in part by school psychologists responsible for the assessment of students with deafblindness. In 1997, the Indiana Deafblind Services Project conducted a statewide needs assessment of school psychologists regarding their practices, competencies, and training needs. A questionnaire was distributed to 373 school psychologists, of which 158 responded. Respondents indicated their greatest areas of concern were inadequate training, inadequate experience, and inadequate test instruments. The specific aim of the PHASES training workshops was to promote the knowledge and proficiency of practitioners to conduct meaningful evaluations of students with deafblindness.

In addition to these activities, a needs assessment questionnaire was developed by this project and sent to collaborating state deaf-blind projects. The questionnaires were then sent to practitioners responsible for assessing students. The purpose of the survey was to identify general concerns held by practitioners and to document their perceived needs regarding the evaluation of students with deaf-blindness. Of the 42 questionnaires returned, almost half of the respondents (48%) indicated that availability of assessment resources and instruments was a major concern, and that gaining access to appropriate instruments would help to enhance their ability to conduct meaningful assessments. A similar number (45%) indicated that inservice training on issues related to assessment would help them better evaluate students with deaf-blindness. These findings, along with the information gathered from the survey conducted during the PHASES training workshops, helped to identify and examine specific concerns held by practitioners related to psychoeducational assessment. Appendix G contains a copy of the questionnaire.

Finally, during the spring of 1998, the project conducted a survey of parents and guardians of school-age children with deafblindness. The purpose of the survey was to identify specific issues and concerns, from a parent perspective, regarding psychoeducational assessment. The National Family Association for Deaf-Blind (NFADB) collaborated with the project by agreeing to send a questionnaire to its membership. The two-page questionnaire asked families to discuss their concerns and to send copies of previously written psychoeducational evaluations to the project. Families were specifically asked to share their thoughts and experiences on psychological and educational assessments. Twenty-five families responded to the NFADB survey by sending the project copies of their children's evaluations along with comments regarding whether or not the reports were helpful and presented a "fair picture" of their child. Analysis of the evaluation reports and comments from parents were incorporated into the Deaf-Blind Perspectives article.

Objective 5. To demonstrate a model for state deaf-blind projects to support the training and informational needs of personnel involved in the psychoeducational assessment of students with deaf-blindness. This objective addressed the extensive need for ongoing training and support of personnel to conduct meaningful psychoeducational assessments of students with deaf-blindness. This need is indicated by the frequent requests made to state deaf-blind projects, as well as to national information centers such as DB-LINK, for information, inservice training, and/or technical assistance specifically on psychoeducational assessment. When the potential impact of this project was initially considered, information was obtained from state coordinators of 307.11 projects on psychoeducational assessment. With the assistance of DB-LINK and TRACES, coordinators of six states in the Western region were asked to estimate the percentage of technical assistance requests that were made related to assessment (requests concerning specific children, training requests, and requests for information). Estimates from the six states ranged from 20% to 80% (G. Leslie, personal communication, October 6, 1995). State coordinators commented that inservice training on assessment, and information about assessment tools were common. In addition, a survey was conducted by personnel associated with the deaf-blind project of the state of Indiana, and involved school psychologists working with children with dual sensory impairments (K. Goehl, personal communication, October 11, 1995). Of the 23 respondents to the survey, 20 reported that their training and experience had been insufficient to perform psychoeducational evaluations of these children. The majority of respondents reported that they either conducted the evaluations independently or with one other professional, and several remarked that they were unfamiliar with assessment procedures.

An important objective of this project was to assist states in their ability to meet these types of information requests and training needs by demonstrating a model in which psychologists, educational evaluators, and other learning specialists are provided materials and resources developed by this project, and given technical assistance in utilizing the materials for self-study and professional development. In developing such a model, it was recognized that, over the long term, inservice workshops may be insufficient to meet the constant demand for training,

caused both by frequent changes of personnel and the expansion of schools and settings in which deaf-blind students are educated. The objective was to assist states to disseminate information and provide support in the form of technical assistance, rather than inservice training.

Specific activities. Through collaboration with state 307.11 projects, several schools, agencies or programs in need of technical assistance related to psychoeducational assessment of students with deaf-blindness were identified. The project worked with states to provide technical assistance and support through the use of resource materials and by participating in training activities. Training activities included workshops which emphasized "train-the-trainer" and self-study/self-review models of professional development. In 1996, the state of Maryland initiated a project in which three psychologists in three counties were identified for a "partnership training model." The program consisted of 10 days of training and one day of follow-up meetings over the course of a nine month period. The aim was to increase the proficiency of school psychologists to conduct meaningful evaluations of students with deaf-blindness and to share their expertise with other professionals. The Project Director served as a psychology consultant and provided training to the three school psychologists. The model emphasized the evaluation of students' cognitive and communicative skills in the context of natural educational and social activities (e.g., in the classroom during group activity, outside during recess), and in turn placed less significance on traditional methods of assessment. The training program also demonstrated an opportunity for building local capacity through a "train the trainer" model of inservice. The training model implemented in Maryland was successful in developing the skills of one psychologist who can now consult on issues related to the assessment of students with deaf-blindness throughout the state. Similar training programs were developed for educational teams in the states of Kansas, South Carolina, Utah, Montana, Indiana, and Hawaii. As with the model in Maryland, the Project Director provided training and consultation to practitioners in these states. Table 3 presents the training programs and provides a description of the duration, audience, model of training, and outcomes associated with the various programs.

Table 3. Training Programs.

State	School Year	# Days*	Duration	# Participants	Audience	Model	Outcomes
Maryland	1996-1997	10 + 1	9 months	3	School Psychologists	Partnership Training Model	Maryland DB Project can consult with the 3 psychologists
Utah	1997	2	2 days	50	Evaluators, Teachers, Administrators from Utah Schools for the Deaf and Blind	Seminar and small group meeting	Increased awareness of USDB staff on appropriate forms of evaluation and provision of assessment resources
Montana	1997	1	1 day	35	Psychologists, Teachers, Related Service Providers (OT, PT, Speech)	Pre-conference Workshop	Increased awareness regarding forms of evaluation and provision of assessment resources
S. Carolina	1998	2	2 days	40 to 50	Teachers, Parents, Education Evaluation Team Members	Intensive Workshop with case presentations and discussions	Exposure of educators/parents to ecological approach to assessment, distribution of assessment tools and resources

State	School Year	# Days*	Duration	# Participants	Audience	Model	Outcomes
Kansas	1997-1998	4	4 months	30	Teachers, Psychologists, Other Evaluators	Teaming Model (6 teams with 5 members on each; conducted actual assessments between first and last days of training)	Increased effectiveness of evaluation teams, actual evaluations conducted, teams across state were provided with assessment resources
Indiana	1998-1999	5 + 1	5 months	25	School Psychologists	Field-based Model (formal workshops conducted with individual assignments carried out in between training sessions)	Support and extensive resources given to participants; library of assessment tools expanded; networks of trained psychologists established
Hawaii	1999	4 + 12	9 months	80	Teams and individuals representing all disciplines	Workshop followed by team process with each district. Each district identified a student for assessment.	Increased effectiveness of evaluation teams, actual evaluations conducted, teams across state were provided with assessment resources

* Number of days of training program + number of days of follow-up.

Finally, in addition to the numerous training workshops, this model of psychoeducational assessment has also been presented by Dr. Mar and Dr. Sall at several professional meetings, conferences, and seminars. These include:

- Mar, H. H. (March, 2000), Psychoeducational Assessment: Critical Issues and Strategies for the Assessment of Students with Severe or Multiple Disabilities. Teleconference presentation sponsored by the Pennsylvania Department of Education, Western Instructional Support Center/Distance Learning Center.
- Mar, H. H. (October, 1999), Psychoeducational Assessment of Children and Adolescents with Deaf-Blindness. Presentation at the Annual Project Directors' Meeting, Washington, DC.
- Mar, H. H. (December, 1998), Psychoeducational Assessment of Children and Adolescents with Deaf-Blindness. Presentation at the Annual TASH Conference, Seattle WA.
- Mar, H. H. (October, 1998), Psychoeducational Assessment of Children and Adolescents with Deaf-Blindness. Presentation at the Annual Project Directors' Meeting, Washington, DC.
- Sall, N. (November, 1998), Assessment of Communication Skills. Seminar, Teacher Education, Dominican College, Orangeburg, NY.
- Sall, N. (December, 1997), Conducting Psychoeducational Assessment of Students who are Deaf-Blind. Presentation at the Annual TASH Conference, Boston, MA
- Sall, N. (November, 1997), Dimensions of Communication: Developing a Communication Profile for Students with Severe Disabilities. Presentation at the New York State Chapter of the Council for Exceptional Children Convention, New York, NY.
- Mar, H. H. (December, 1996), Partnerships in Deaf-Blindness: A Training Program for School Psychologists. Presentation at the Annual TASH Conference, New Orleans, LA.

References

Adams, J. (1993). Self-determination. In J. W. Reiman and P. A. Johnson (Eds), Proceedings of the National Symposium on Children and Youth who are Deaf-Blind. Monmouth, OR: Teaching Research.

Billingsley, R.R., Huven, R., & Romer, L.T. (1995). Behavioral support in inclusive school settings. In N.G. Haring & L.T. Romer (Eds.), Welcoming students who are deaf-blind into typcial classrooms: Facilitating school participation, learning, and friendships (pp. 251-276). Baltimore: Brookes.

Carr, E.G., & Durand, V.M. (1985). Reducing behavior problems through functional communication training. Journal of Applied Behavior Analysis, 18, 111-126.

Collins, M.T. & Rudolph, J.M. (1975). A manual for the assessment of a deaf-blind multiply handicapped child. Watertown, MA: Perkins School for the Blind.

Evans, I.M. (1991). Testing and diagnosis: A review and evaluation. In L. H. Meyer, C. A. Peck, & L. Brown (Eds.), Critical issues in the lives of people with severe disabilities (pp. 195-217). Baltimore: Brookes.

Giangreco, M.F., Cloninger, C.J., & Iverson, V.S. (1993). Choosing options and accommodations for children: A guide to planning inclusive education. Baltimore: Brookes.

Goldstein, D. (1993). Technology: Some considerations for the present and future. In J. W. Reiman, & P. A. Johnson (Eds.), Proceedings of the National Symposium on Children and Youth who are Deaf-Blind (pp. 233-239). Monmouth, OR: Teaching Research.

Haring, T., Haring, N. G., Breen, C., Romer, L. T., & White, J. (1995). Social relationships among students with deaf-blindness and their peers in inclusive settings. In N. Haring & L. Romer (Eds.), Including students with deaf blindness in typical education settings (pp. 307-346). Baltimore: Paul Brookes.

Irons, D., Irons, T., & Maddux, C.D. (1984). A survey of perceived competence among psychologists who evaluate students with severe handicaps. Journal for the Association for Persons with Severe Handicaps, 9, 55-60.

Langley, M.B. (1986). Psychoeducational assessment of visually impaired students with additional handicaps. In D. Ellis (Ed.), Sensory Impairments in Mentally Handicapped People. San Diego: College Hill Press.

Mar, H.H. (1991). Retooling psychology to serve children and adolescents with severe disabilities. School Psychology Review, 20, 510-521.

Mar, H.H. (1995). Assessment of communication skills. In Huebner et al. (Eds), Hand in Hand: Essentials of communication and orientation and mobility for your students who are deaf-blind. NY: AFB Press.

Mar, H.H. & Sall, N. (1990). Profiles of expressive communication and social interaction. Paper presented at TASH conference, Chicago, IL.

Mar, H.H., & Sall, N. (1994). Programmatic approach to use of technology in communication instruction for children with dual sensory impairments. Augmentative and Alternative Communication, 10, 138-150.

Mar, H.H., & Sall, N. (1995). Enhancing social opportunities and relationships of children who are deaf-blind. Journal of Visual Impairment and Blindness, 89, 280-286.

McLean, J. E., & Snyder-McLean, L. (1988). Application of pragmatics to severely mentally retarded children and youth. In R. L. Schiefelbusch & L. L. Lloyd (Eds.), Language perspectives: Acquisition, retardation, and intervention (2nd ed., pp. 255-288). Austin, TX: Pro-Ed.

McLetchie, B.A.B. (1993). Personnel preparation. In J. W. Reiman and P. A. Johnson (Eds), Proceedings of the National Symposium on Children and Youth who are Deaf-Blind. Monmouth, OR: Teaching Research.

Popoff, L.E. (1985). Psychological evaluation of deaf-blind individuals: A nationwide survey. Paper presented at the American Psychological Association, Los Angeles, CA, August, 1985.

Rowland, C., & Stremel-Campbell, K. (1987). Share and share alike: Conventional gestures to emergent language for learners with sensory impairments. In L. Goetz, D. Guess, & K. Stremel-Campbell (Eds.), Innovative program design for individuals with dual sensory impairments (pp. 49-75). Baltimore: Brookes.

Schein, J.D., Kates, L., Wolf, E.G., & Theil, L. (1983). Assessing and developing communication abilities of deaf-blind children. Journal of Visual Impairment and Blindness, 77, 152-157.

Sigafoos, J., Cole, D.A., & McQuarter, R.J. (1987). Current practices in the assessment of students with severe handicaps. Journal of the Association of Persons with Severe Disabilities, 12, 264-273.

Stillman, R. (1975). Assessment of deaf-blind children: Callier-Azusa scale. Dallas: Callier Center for Communication Disaorders, University of Texas at Dallas.

Stillman, R. (1978). Assessment of deaf-blind children: Callier-Azusa scale. Dallas: Callier Center for Communication Disaorders, University of Texas at Dallas.

Sullivan, P.M. & Vernon, M. (1979). Psychological assessment of hearing impaired children. School Psychology Digest, 8, 271-290.

Vernon, M, Bair, R., and Lotz, S. (1979). Psychological evaluation and testing of children who are deaf-blind. School Psychology Digest, 8, 291-295.

Vernon, M. (1976). Psychologic evaluation of hearing impaired children. In L.Lloyd (Ed.), Communication, assessment, and intervention strategies. Baltimore: University Park.

Vernon, M. (1987). Psychological adjustments and psychological assessments of deaf-blind children. Psychosocial interventions with sensorialy disabled persons, NY: Grune & Stratton.

Vernon, M., & Green, D. (1980). A guide to the psychological assessment oif deaf-blind adults. Journal of Visual Impairment and Blindness, 74, 229-231.

Appendix A:

Profiles of the Expressive Communication Skills of Children and Adolescents with Severe Cognitive Disabilities

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Profiles of the Expressive Communication Skills of Children and Adolescents with Severe Cognitive Disabilities

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Abstract: This study examined communication behaviors of children and adolescents with severe cognitive disabilities. Communication samples of 103 participants with severe or profound mental retardation, ages 3 to 15 years, were obtained through natural observations and structured one-to-one interactions. The communication samples were analyzed to determine primary expressive forms of communication, as well as degrees to which use of symbols, intentionality, social reciprocity, and complexity were apparent. From these data, seven Communication Profiles were distinguished to characterize levels of communicative competence within this population, ranging from basic reactions to complex interactions. Differences were noted in the patterns of communication forms and profiles between participants with severe versus profound mental retardation, but age differences (older versus younger individuals) were not observed. The potential use of the Communication Profiles as a conceptual framework to assess functional communication skills and consider meaningful intervention goals was discussed.

Research on the communication skills of persons with severe cognitive disabilities has increased considerably in recent years. Most of this literature has focused on the use of specific intervention strategies including, for example, functional communication training (e.g., Carr & Durand, 1985), symbol systems (e.g., Franklin, Mirenda, & Phillips, 1996), and augmentative communication (e.g., Reichle, York, & Sigafoos, 1991). Not only has this research yielded an extensive technology of instructional methods and tools, but it has also served to emphasize the importance of interventions within natural milieus and social contexts (e.g., Bricker, 1992; Kaiser, 1993).

In contrast, little research has been conducted to broaden our conceptual models, or frameworks with which to characterize communicative competence of a population typically described as "nonspeaking" or "nonverbal" (McLean & Snyder-McLean, 1988). Communication skills of persons with severe cognitive disabilities have been often viewed within a developmental perspective whereby linguistic qualities and structures (e.g., two-word combinations) are associated to the age ranges in which they usually first appear. A practice especially salient in assessment is to broadly describe the communication abilities of individuals with severe disabilities, including adolescents and even adults, by these age levels or age ranges (Sigafoos, Cole, & McQuarter, 1987).

However, descriptions of communication behaviors in terms of normal parameters and developmental sequences may be misleading or may not adequately reflect the competence of individuals with severe cognitive disabilities, who may learn alternative means of communication over extended periods of time (Romski & Sevcik, 1992) and whose social opportunities and experiences may differ from those

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of young children without disabilities. For instance, in a study involving 15 children and adolescents with severe or profound mental retardation, Cirrin and Rowland (1985) identified various actions (e.g., pointing, extending object, opening palm, pushing away) that were not formal language behaviors but which were clearly and intentionally communicative. These authors also noted extreme individual differences in the types, functions, and frequency of communicative acts. Romski, Sevcik, Reumann, and Pate (1989) reported that, despite the absence of formal means of oral communication, children with moderate or severe mental retardation were consistently successful conveying messages to adults and peers. In addition, the children's modes of communication (e.g., words, gestures, vocalizations) and specific conversational patterns were found to be differentially influenced by the communicative styles of their partners. Wetherby, Yonclas, and Bryan (1989) sampled the communication behaviors of children with and without disabilities in structured contexts designed to elicit child-initiated communicative acts. Comparing the communication profiles of young children who had Down Syndrome, autism, or specific language impairments to those of typically developing prelinguistic children, these authors found qualitative differences between the two samples in discourse structure as well as the functions of communicative behaviors.

Thus, while there may be parallels between early language development and the communication behaviors of individuals with severe cognitive disabilities, studies like those described above indicate that there are also inherent differences in the dynamic skills and processes required to achieve communicative, as opposed to linguistic, competence. Further, to the extent that the former may be achieved without necessarily achieving the latter, communicative competence must be defined by and analyzed for behavioral qualities, forms, sequences, and patterns that may not be relevant in the acquisition of language *per se*. Indeed, Rowland and Stremel-Campbell (1987) have suggested that the transitional stages from presymbolic to symbolic communication are particularly significant in the communication development of children with severe disabilities, but do not seem to emerge as a distinct stage of development for most children without disabilities.

An alternative approach to characterize the degrees and sequences of communicative behavior specifically of individuals who have severe cognitive disabilities has been proposed by McLean and Snyder-McLean (1988), who applied a pragmatics model to the analysis of communication patterns. Their approach is descriptive and places emphasis on interactive, as opposed to linguistic, qualities of communication behavior. As such, communicative competence is viewed in terms of how effectively one conveys a message, and the degrees to which social processes and functions are evident, such as intentionality (i.e., purposeful signaling of others), joint focus, and reciprocation. These authors described a taxonomy for classifying an individual's behavior into one of six sublevels, defined conjointly by level of communicative intent and the conventionality of communication signals or forms. Similarly, Rowland and Stremel-Campbell (1987) proposed a sequence of seven levels of communicative competence in which expressive forms ranged from involuntary reactions or reflexes (pre-intentional behavior) to abstract, formal, and complex output (symbolic language). In their model, each level of competence is defined by the degree of intentionality, symbol use, and conventionality apparent in one's communication behaviors. A critical advantage of using such descriptive models to characterize communication behaviors of individuals with severe cognitive disabilities is that they are much more closely tied to intervention planning. A description of an individual's communicative competence in terms of such attributes as symbolic functioning and intentionality has direct implications, for example, in the consideration or design of an augmentative communication system. Further, rather than defining communicative competence in terms of formal linguistic achievements, such models are concerned with how efficiently functional language is actually used in the natural social environment.

In this study, the communication behaviors of a large sample of individuals with severe cognitive disabilities were analyzed. The primary purpose was to apply a sequence of analyses leading to the development of a data-based conceptual framework to characterize

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different patterns or profiles of the communicative competence of individuals within the population. More specifically, this study sought to: (1) examine the breadth and variation of expressive communication forms among persons with severe cognitive disabilities; (2) analyze their communication skills in terms of the degrees to which specific attributes were present (use of symbols, intentionality, social reciprocity, complexity); (3) describe the patterns and profiles of communication behaviors within the sample; and (4) examine the relationships of age and degree of mental retardation to communicative competence.

Method

Participants

The participants for this study included 103 students, whose ages ranged from 3 years, 0 months to 15 years, 10 months. The average age was 9.06 years (SD = 2.99). There were 56 boys and 47 girls. Students were identified by their teachers and described by educational records as having multiple disabilities. Within this sample, 65 students (63.1%) had severe mental retardation, and 38 students (36.9%) had profound mental retardation as indicated in recent reports of psychological assessment. The participants attended a total of 14 public and private schools in various sections of New York City where they were enrolled in special education classrooms and programs. Most students received specialized services including communication therapy, physical therapy, occupational therapy, and/or other related services. The students were from diverse ethnic, religious, linguistic, and socioeconomic backgrounds.

The primary diagnoses of all participants were obtained from school records. Within the sample, 30 students (29.1%) had cerebral palsy; 22 students (21.4%) had nonspecific diagnoses such as developmental delay or multiple disabilities; 21 students (20.4%) had neurological or seizure disorders as primary diagnoses; 10 students (9.7%) had disabilities associated primarily with prematurity; 7 students (6.8%) had Down Syndrome, and the remaining 13 students (12.6%) had other specific syndromes or disorders (e.g., Congenital Rubella Syndrome, CHARGE Syndrome, autism). In addition to having severe or profound mental retardation, participants were noted to have one or more other disability conditions, including deaf-blindness or dual sensory impairments (condition present in 17 of the 103 students, or 16.5% of the sample), hearing impairment or deafness (7 students, or 6.8%), visual impairment or blindness (36 students, or 35.0%), physical disabilities (43 students, or 41.7%), serious behavioral or emotional disturbance (6 students, or 5.8%), and fragile health or medical conditions such as active seizure disorders, feeding problems, or respiratory conditions (34 students, or 33.0%).

Communication Sampling Procedures

An extensive set of data was collected on each of the 103 participants to obtain descriptive information about specific forms and qualities of their communication and social interaction behaviors. Each student's educational records were first reviewed to obtain general information on individual characteristics, communication behaviors, psychosocial issues, medical history, cognitive and learning skills, educational objectives and programs, and physical abilities and disabilities. A communication sample for each student was then obtained, consisting of data collected through classroom observations and structured one-to-one interactions.

Classroom observations. Each student was observed for at least one period of 30 to 60 minutes in a classroom setting. Observations were made of the student only during activities that provided natural opportunities for social interaction with the teacher and/or peers. These activities included, for example, music time, lunch, art, recess, small group or cooperative learning tasks, and free time. Sequences of behaviors, language, social responses, and interactions were recorded verbatim by one of two observers, both of whom have had previous experience conducting naturalistic observations. A second observation of the same student on a different day was conducted if the observer deemed it necessary to obtain additional information.

Structured one-to-one interactions. Within two weeks of the classroom observation, the stu-

dent was engaged by one of the observers in a structured one-to-one interaction. Extensive field notes of the student's communication behaviors and sequences of interactive exchange were recorded. These 30-minute sessions, usually conducted in an area close to or within the student's classroom, were similar in purpose and format to the structured communication sampling procedures described by Wetherby et al. (1989) in their study of the communication profiles of preschool children with language impairments. Specific age-appropriate tasks and activities were selected to promote opportunities for interaction and communication. These activities included simple game playing, drawing, object exploration, and learning tasks, and utilized objects and materials ranging in visual, auditory, and tactile features. Activities were conducted one at a time, and involved such concepts and skills as visual or auditory attention (e.g., localizing and orienting to musical objects), cause-and-effect learning (e.g., wind-up toys, switch-activated radio), imitation (e.g., follow-the-leader game), matching (e.g., pictures to objects, puzzles), choice making (e.g., selection of preferred object for play), comprehending (e.g., following one- to three-step directives), and reciprocation (e.g., rolling a ball back and forth). Students were allowed to initiate or change activities, or to focus on materials of preference or interest. Throughout a session of structured interaction, the observer would use speech, gestures, single signs, object cues, or other means to interact. Students' communicative responses were solicited by such means as handing them objects, removing objects and waiting for responses, directing interest toward attractive materials, activating mechanical toys or devices, stopping and continuing enjoyable activities, greeting them or calling out their names, providing touch cues or gestural cues to promote action, and asking simple questions.

Results

The 103 communication samples were analyzed to: (1) examine the range of expressive communication forms within the sample; (2) assess the variability in the degrees to which certain attributes, including symbol use, communicative intent, social exchange, and complexity, were reflected in the communication samples; (3) identify specific patterns and profiles of communicative competence within the sample; and (4) examine communication forms and profiles in relationship to degree of mental retardation and age.

Forms of Expressive Communication

Various existing communication assessment protocols (e.g., Donnellan, Mirenda, Mesaros, & Fassbender, 1984; Sullman & Battle, 1983) were first reviewed to identify specific forms of behavior that were communicative or could potentially have communicative value. Over 30 specific behaviors were identified, including, for example, eye gaze, reactive body movements, facial expressions, nodding, vocalizations, laughing, grunting, aggression, respiratory patterns, self-injurious behavior, pantomime, head turning, single signs, complex speech, etc. Each behavior was subsumed under one of seven categories: *reactive behaviors, direct behaviors, gestures, vocalizations, signs, speech,* and *augmented communication.* These categories have been previously used to characterize forms of expressive communication behaviors among learners with severe disabilities (e.g., Rowland & Stremel-Campbell, 1987; Sullman & Siegel-Causey, 1989). Operational definitions and examples of communication behaviors for each form are presented in Table 1.

Each communicative act or response in a student's verbatim communication sample was listed in sequence, and then classified into one of the seven forms based upon the quality of the behavior and the context in which it occurred. Information obtained during brief interviews of teachers and/or speech-language pathologists was used to confirm students' primary communication forms. A student's primary expressive form was defined as the most frequent category of expressive behaviors reflected within his or her communication sample. The inter-rater reliability coefficient for .26 of the sample (27 students) was .81 for the determination of primary forms. As can be seen in Table 1, slightly more than half the students in the sample (.53) used direct behaviors as the primary form of expression. Reactive behaviors (.17) and gestures (.13) were the second and third most frequent

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TABLE 1

Primary Forms of Communication

Communication Form	*% and No. of Students*	*Description and Examples of Expressive Form of Communication*
Reactive behavior	.16 (n = 17)	Basic reflexes, reactions, and orientation responses to social stimuli. Reactive behaviors may also express internal states or needs such as hunger, discomfort, and pleasure, all of which must be interpreted by the communication partner. Examples: opens eyes wide when loud music is played; turns head when teacher enters room; makes facial grimace in response to undesired food; extends arms to indicate desire for object; cries when hungry.
Direct behavior	.53 (n = 55)	Physical and direct action upon objects or persons in attempt to satisfy desires, needs, and interests. The behaviors, themselves, represent the messages. Examples: grabs for toy; pushes away bowl of food; kicks peer when angry; makes eye contact and reaches toward or touches peer to initiate interaction.
Gesture	.13 (n = 13)	Physical movements and actions, including single-sign approximations, which convey certain meanings and are often closely associated to one's immediate state, interests, or needs. Examples: points to a desired object; waves "hello" to peer to get attention; nods "Yes;" claps to indicate "All done" when task is finished.
Vocalization	.09 (n = 9)	Oral, nonspeech sounds, including word approximations, which may be produced in the context of social interactions and have specific meanings. Examples: "mo" to indicate "more"; "yi" to gain attention; "ba" for "book;" "ut" used to mean both "up" and "cup".
Sign	.01 (n = 1)	Manual production of letters and words in a recognizable language. Examples: American Sign Language; Signed Exact English; etc.
Speech	.08 (n = 8)	Oral production of words in a recognizable language. Examples: English; Spanish; etc.
Augmentation	.00 (n = 0)	Use of external aids or devices that facilitate the expression and/or reception of messages. Examples: communication books; electronic devices; photos or picture symbols; tangible symbols; paper and pencil.

forms, respectively, followed by vocalizations (.09), speech (.08), and sign language (.01). No student in this sample used augmentative devices as the primary form of communication.

Communication Attributes

Each student's communication sample was also analyzed and rated with respect to four attributes, including the degree of: (1) use of symbols; (2) intentionality; (3) social reciprocity; and (4) complexity. These attributes have been identified as critical to the development of functional communication skills of persons with severe cognitive disabilities (e.g., Carter, Hotchkis, & Cassar, 1996; McLean & Snyder-McLean, 1988; Reichle, Halle, & Johnston, 1993; Romski et al., 1989). For each attribute, a student was given a rating of 1 (low) to 5 (high) corresponding to the highest level of competence consistently reflected within his or her communication sample. Inter-rater reliability coefficients based upon .19 of the sample were .75 for intentionality; .78 for social reciprocity; .86 for complexity; and .87 for use of symbols. The operational definition and the specific rating criteria for each attribute are summarized below.

Use of symbols. Use of symbols refers to an individual's ability to associate objects, per-

sons, and events to words, signs, gestures, utterances, pictures, tactile impressions, and other representations. In rating an individual's ability to use symbols, such qualities as the degree of abstractness and the conventionality of the symbols used were taken into account: (1) *nonsymbolic communication*, including reactive or reflexive behaviors (e.g., student smiles when pleasant sensation is felt, flaps or moves arm when preferred object is shown); (2) *presymbolic communication*, in which direct behaviors are used to express needs or desires (e.g., student points to desired object, produces a word approximation, or reaches for an object); (3) *basic use of symbols*, in which single concrete, conventional symbols are used to label an object, person, or activity (e.g., student says "cookie", signs "eat", or points to a picture of a cassette tape player); (4) *extended use of symbols* to relate objects, events, and persons together or to represent abstract ideas (e.g., student says "John work" to indicate someone's whereabouts, signs "finished," then "juice" to request a snack after a task; (5) *elaborate use of symbols*, in which specific ideas, needs, or comments are expressed using syntactic rules.

Intentionality. Communicative intent refers to a person's ability to deliberately signal another person to gain attention, respond, comment, or express a need or desire. Intentionality was rated as follows: (1) *reactive behaviors* which are elicited without calling for someone's attention (e.g., student cries when agitated); (2) *preintentional communication*, in which an individual is aware that his or her behaviors can affect the behaviors of others (e.g., student shouts to gain attention, bangs on the radio when music stops); (3) *basic intent*, which refers to the ability to deliberately signal another person to convey simple needs, desires, or interests (e.g., student tugs on another's sleeve; points to one of two pictures on communication board to make choice; (4) *awareness of social context*, or one's ability to approach a specific person or to make appropriate requests or comments in the context of the event or activity (e.g., student greets peer; knows to ask certain adult for a snack); (5) *deliberate communication* with forethought to initiate or respond to interaction (e.g., calls a friend on the telephone; asks for directions to complete a required task).

Social reciprocity. This attribute refers to the extent to which a person engages in and understands the give-and-take nature of social exchanges. Ratings corresponded to these degrees of social reciprocity: (1) change in activity level or *nonspecific behavioral reactions* when another person initiates an interaction (e.g., student cries, vocalizes, or smiles when greeted); (2) *simple specific response* to another person's interaction (e.g., student responds to one-step command, waves when someone says "Bye"); (3) *emerging reciprocity*, or the ability to initiate or continue an interaction by signaling another person as if to expect a response (e.g., student signs "more" to request snack, approaches a child to show a toy); (4) *brief social exchanges*, as exemplified by very short conversations or interest in play with others for short periods; (5) *reciprocal interactions*, or the ability to appropriately engage in extended social exchange (e.g., student can participate in lengthy conversation, understands turn-taking nature of discussion).

Complexity. This is characterized by such qualities of communication as mean length of utterance, use of syntax, and grammatical structure. Communication samples were given one of the following ratings: (1) *simple reactive behaviors;* (2) *single behaviors*, in which one action, gesture, or vocalization conveys an idea (e.g., student signs "eat", says "car"; (3) *simple combinations*, in which more than one symbol or behavior are sequenced to produce a simple message (e.g., student says "music finished", points to desired object and signs "more"; (4) *short combinations*, including 3- to 5-string sentences (e.g., "David's cup finished," "School all done, go home.") in which early rules of grammar and syntax are followed; (5) *formal language*, which includes elaborate and complex language constructions following grammatical and syntactic rules.

Table 2 provides a summary of the ratings of students' levels of proficiency across attributes. As can be seen, the communication samples of more than half of the students in the study (.53 to .58) were given ratings of Level 2 for each of the attributes. With respect to Use of Symbols and Complexity, the second most frequent rating was Level 1 (nondifferentiated reactions). In contrast, for the attributes of Intentionality and Social Reciproc-

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TABLE 2

Percentage of Students within each Rating for Communication Attributes

Communication Attribute	Rating				
	1	*2*	*3*	*4*	*5*
Use of symbols	.27	.58	.10	.03	.02
Complexity	.54	.54	.09	.02	.01
Intentionality	.18	.53	.23	.05	.01
Social reciprocity	.17	.54	.23	.05	.01

ity, the second most frequent rating was Level 3, which indicates that the attribute is present in a simple, emerging, or basic form. Table 2 also shows that there were few ratings of Level 5.

Communication Profiles

Examination of the 103 communication samples revealed that there were 25 unique patterns. A pattern is defined by the ratings (1 to 5) across all four attributes for a given individual. These 25 patterns were collapsed into seven pattern types, based upon the distribution of students whose ratings fell within certain restricted ranges. Table 3 presents a summary of pattern types and the number of communication samples corresponding to each. For each pattern type, the most common specific pattern is also shown.

The majority of students' communication samples (.92) were associated with Patterns I to IV. Pattern III was the most frequent, accounting for .40 of the communication samples. Only a few students (.03) obtained high ratings (4 or 5) across attributes. It is also worth noting that in only two of the 103 communication samples did ratings across attributes differ by more than one level (e.g., from 1 to 3). In the majority of the communication samples (.72), at least three of the four attributes were given the same ratings.

These seven pattern types, based upon the quantitative ratings of attributes, provided a mechanism for generating seven corresponding Communication Profiles, or qualitative descriptions of the similarities and differences in communication behavior across individuals with severe cognitive disabilities. The purpose of developing Communication Profiles was to integrate information across attributes to form portraits of expressive communication and social interaction skills, one of which would typify the competencies of any given individual within this population.

A description of the seven communication profiles and examples of specific behaviors within each profile are presented in Table 4. Communication Profile I (Pattern I in Table 3), accounting for .10 of the sample, characterized students who used nonsymbolic, nonintentional, and generally reactive or reflexive behaviors. Communication Profile II (.20 of the sample) included individuals who communicated using simple specific responses and single expressions. Students whose skills could be described by Communication Profile III

TABLE 3

Patterns and Ratings across Attributes

% and No.	Pattern/Profile	Range of Rating	Description of Rating	Most Common Pattern of Attributes			
				Symbol	*Complex*	*Intent*	*Social*
.10 (10)	I	1	Rating of 1 across all attributes	1	1	1	1
.20 (21)	II	1–2*	Ratings of 2 on 1 or 2 attributes	1	1	2	2
.40 (41)	III	1–2	Ratings of 2 on 3 or 4 attributes	2	2	2	2
.22 (23)	IV	2–3*	Ratings of 3 on at least 1 attribute	2	2	3	3
.05 (5)	V	3–4	Ratings of 3 or 4 on each attribute	3	3	3	3
.02 (2)	VI	4–5	Ratings of 4 or 5 on each attribute	5	4	4	4
.01 (1)	VII	5	Ratings of 5 across all attributes	5	5	5	5

* One communication sample in group has more variation in range than others.

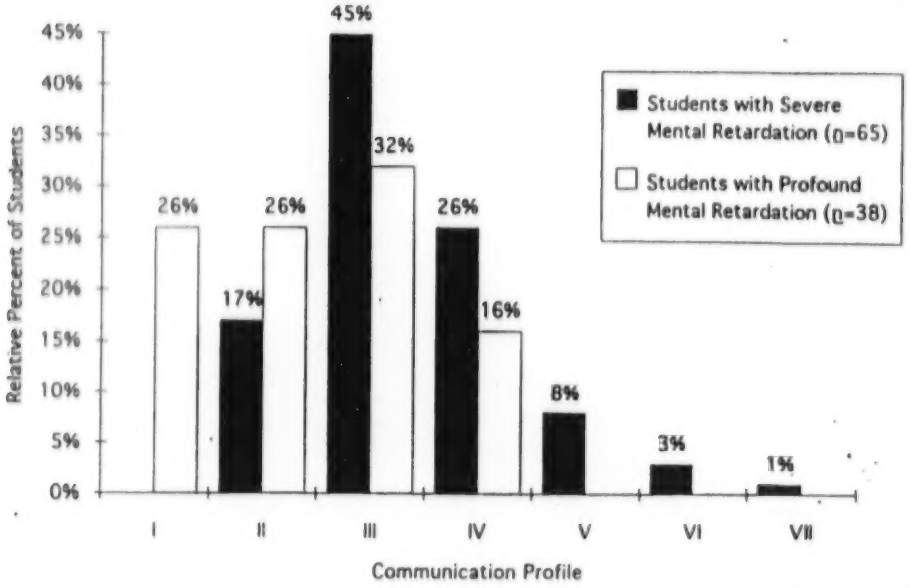

Figure 2. Communication profiles of students with severe versus profound mental retardation.

with profound mental retardation (.26), but none with severe mental retardation, was characterized by Communication Profile I. In contrast, Communication Profiles V, VI, and VII accounted for .12 of students with severe mental retardation and none with profound mental retardation, indicating greater communicative competencies in this group of students as compared to their peers with profound mental retardation.

Two chi-square analyses were also conducted to examine whether patterns of expressive communication forms and Communication Profiles differed as a function of age. For these two analyses, the sample was separated into a younger (n = 52, 3.0 to 9.1 years) and older (n = 51, 9.2 to 15.7 years) group. No significant differences were obtained.

Discussion

This study sought to characterize broad patterns and sequences of communicative competence among individuals with severe cognitive disabilities. Although conceptual frameworks to describe communicative competence of individuals in this population have been previously proposed (McLean & Snyder-McLean, 1988; Rowland & Stremel-Campbell, 1987), they have not been based upon systematic analyses of observations of communication behaviors occurring in the context of natural interactions.

Analyses of the 103 communication samples generally depict this population as having very diverse forms and qualities of communication behavior. Clearly, direct behaviors represented the primary form of expressive communication among the participants (53%), regardless of degree of mental retardation (severe vs. profound). While direct behaviors, which are deliberate enactments of a person's needs and interests, are not symbolic and do not consutute a formal language system, they must be recognized as perhaps the most effective communication means for many individuals with severe cognitive disabilities. Thus, one implication of this finding is that it is as critical for those designing or providing interventions to recognize direct behaviors as having communicative value as it is to teach those skills and behaviors which are more closely associated with conventional forms of language (cf. Stillman, 1993).

Although higher level communication skills are generally associated with higher cognitive abilities or developmental levels, as noted by Wetherby et al. (1989) in their study of the communication profiles of language-impaired preschool children, the results of the present study suggested that among individuals with severe cognitive disabilities, there is not a simple relationship between communicative competence and degree of mental retardation or, for that matter, age. A person's communication profile may not be especially well predicted by traditional indicators of cognitive ability (e.g., IQ, degree of mental retardation). Rather, the data support the notion that there is considerable diversity of communication forms and profiles within subgroups of individuals with severe versus profound mental retardation. Comparisons between the two groups did reveal that students with severe mental retardation, overall, exhibited more complex forms and profiles of communication than those with profound mental retardation. Yet, there was also considerable overlap in the distributions of communication forms and profiles. Many individuals assessed to have profound mental retardation exhibited the same level of communicative competence, or even more complex communication forms and profiles, than those with severe mental retardation.

It also appears that age *per se* is not related to the communication forms and competence of children and adolescents within this population. For example, despite differences between older and younger students in their cumulative social and educational experiences, the overall distributions of communication profiles were comparable for the two groups. Further, direct behaviors were no less prevalent among the older than the younger individuals in this sample. As such, the acquisition of communication skills by individuals with severe cognitive disabilities may not be revealed by traditional age-related parameters used to measure growth (e.g., language age). Hence, the use of developmental models to assess or describe communication behaviors of these students is apt to be inappropriate.

It is worth noting here that 80 of the 103 participants (.78) in this study were observed to rely on more than one expressive form of communication. Subsequent analysis of the communication samples indicated, for example, that within the subgroup of students whose primary communication form consisted of direct behaviors, their secondary forms included gestures, vocalizations, reactive behaviors, signs, or augmentative communication. That most students have multiple communication forms speaks to the importance of using a "total communication" approach to intervention, or the concurrent presentation of speech, signs, gestures, or graphics, for many students within this population (Reichle, 1991). However, in using this approach, it is also critical that the forms incorporated in an intervention plan be individualized to correspond to the student's unique combination of expressive communication forms.

Only a few studies (e.g., Cirrin & Rowland, 1985; Romski et al., 1989) have undertaken to differentiate patterns and degrees of communicative competence among individuals with severe cognitive disabilities, who are typically described as having severe language impairments. The seven Communication Profiles in this study characterize discrete differences along a continuum, ranging from basic reactions to complex interactions, defined by various functional communication attributes. Since the profiles are predicated not on traditional indices of age-related changes in normal language development, but upon the natural behaviors of a large number of students, they may provide more valid, systematic, and functional means to capture the qualitative variations in the attributes, forms, and degrees of communicative competence of individuals with severe cognitive disabilities.

Such a conceptual framework might also be applied as an aid to assessment, as well as a blueprint for considering appropriate intervention objectives and activities. Wetherby and Prizant (1992) have illustrated how the profiling of a child's social-affective, reciprocal, symbolic, gestural, vocal, and nonverbal behaviors can be used to assess changes over time in functional communication skills. These authors noted that few language measures are relevant to individuals with language or communication impairments; the sampling of interactions to obtain profiles of abilities may be a more fruitful approach for observing natural communication skills, rather than set-

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TABLE 4

Communication Profiles

Profile	*Description*
I	Key attributes: nonsymbolic, reactive, nonintentional, nonspecific. Individual orients to and responds to the source of stimulation with simple reactive or reflexive behaviors. These behaviors are generally nondifferentiated and must be interpreted by care provider as expressing certain internal states or needs. Responses and behaviors are specific to immediate situations or needs. Examples: (1) fusses and then quiets when given a drink; (2) startles and shifts body when approached by teacher or momentarily orients to person entering room.
II	Key attributes: nonsymbolic, reactive, preintentional, simple specific behaviors. Individual produces nonsymbolic behaviors, such as a single action or vocalization, in response to stimuli. Behaviors may be intentional, but are not differentiated (e.g., moves hand in specific gesture to indicate want, yet also uses same gesture at other times). Behaviors may be consistent from day to day and across similar situations, and their meanings can often be interpreted by the familiar care provider in the context of the situation. Individual may not communicate in deliberate turn-taking fashion but, rather, may gratify his or her needs at an "object level", i.e., by acting directly upon objects or persons that are physically present. Examples: (1) alternates glance between two objects and then fixates on cup to indicate choice; (2) smiles when seeing a familiar person.
III	Key attributes: presymbolic, single behaviors, preintentional, simple specific responses. Individual communicates mostly through direct behaviors and actions, such as simple gestures. The behavior, itself, is often the message and as such, it may not be a true symbolic representation. However, there may be fragmented use of a few conventional symbols, such as words or sign approximations for labeling people and objects. Communication is directed toward other persons, and the individual is aware that his or her behaviors directly impact others' actions. He or she may initiate a simple interaction and participate in simple turn-taking. Communicative behaviors are closely associated with immediate activities or needs. Behaviors are typically generalized across similar situations, are used with consistency, and are readily deciphered by familiar persons. Examples: (1) extends empty cup toward teacher to indicate desire for more juice; (2) waves "hello" in response to another person initiating the interaction.
IV	Key attributes: presymbolic to symbolic, single behaviors/symbols, basic intent, emerging reciprocity. Individual uses a mix of behaviors and conventional symbols. Some of the utterances or signals are true symbolic representations. Symbols and behaviors are expressed mostly in single form (e.g., one-word utterance or pointing to one picture), but the ability to use some simple combinations may be emerging. Symbols are used for labeling needs, objects, events and persons. The individual is able to express needs, wants, and comments directly to others. Understanding of reciprocity is emerging such that interaction can be either initiated or continued with an appropriate response. Examples: (1) points to juice container and signs "more"; (2) waves "hello" to initiate interaction with another person.
V	Key attributes: basic symbols, simple combinations, basic intent, emerging reciprocity. Individual primarily uses conventional symbols (e.g., object or picture cues, words, signs). Symbols can be combined to connect ideas (two-word sentences) which can comprise verbs, action words, and nouns. Individual spontaneously initiates interaction, imitates sounds or gestures, can easily be understood by others, and can engage in short conversations. Examples: (1) says "want juice" when thirsty; (2) approaches and greets another person with interesting object to share.
VI	Key attributes: extended symbols, short combinations, social awareness, brief exchanges. Individual communicates using a formal symbol system. Symbols are combined to form short strings (three- or four-word sentences), and closely follow syntactical rules. Individual can communicate about objects, events, and abstract ideas beyond the immediate context (e.g., many, fast, later), and understands social conventions (e.g., not interrupting, waiting turn). Examples: (1) knows which teacher to ask for a drink; (2) greets and initiates short conversation with another person.
VII	Key attributes: extended symbols, formal language, intentional, reciprocal interactions. Individual uses language system precisely and fluently, following complex grammatical and syntactical structures. Nonverbal behaviors (e.g., facial expressions) may be used to emphasize statements or convey affect. Conversations are on par with other competent language users such that even when the languages are different (e.g., spoken versus sign), communication can occur readily via a translator. Examples: (1) independently orders a large cup of orange juice and asks for a straw; (2) engages in extensive discussion with another.

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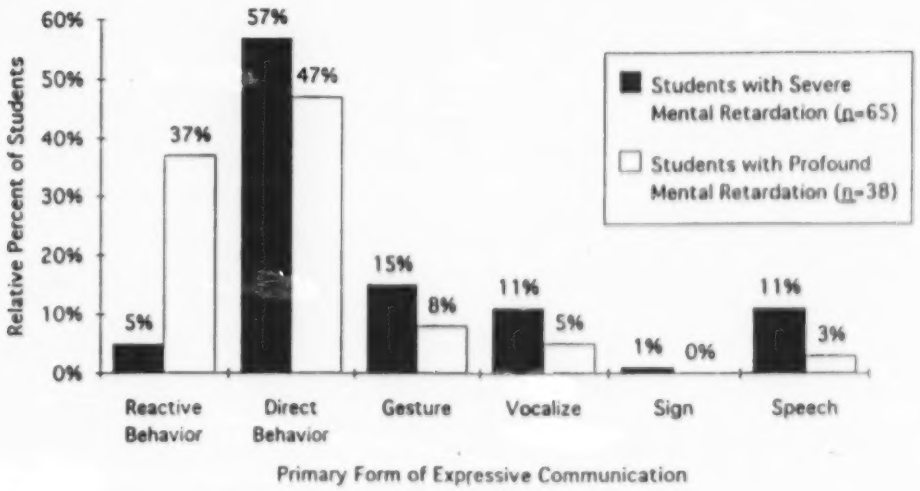

Figure 1. Communication forms of students with severe versus profound mental retardation.

(.40 of the sample) could use basic symbols, form simple combinations of symbols, and direct their interactions toward others. Communication Profile IV (.22 of the sample) described individuals whose skills include extended use of symbols, awareness of social context, and brief social exchanges. In Communication Profiles V to VII, which characterized .08 of the sample, communication involves formal use of symbols, complex sentence structures, and deliberate and reciprocal interactions.

Communication Behaviors in Relation to Mental Retardation and Age

Two analyses were conducted to examine how communication forms and profiles varied as a function of degree of mental retardation. The first analysis examined the range of expressive communication forms among individuals assessed to have severe versus profound mental retardation. Chi-square analysis indicated that there was a significant difference between groups ($X^2 = 20.03$, $p < .01$). As can be seen in Figure 1, the majority of individuals with both severe mental retardation (.57) and profound mental retardation (.47) used direct behaviors as their primary means of communicating wants and needs. However, relatively few individuals with severe mental retardation (.05) used reactive behaviors as their primary communication form, compared to those with profound disabilities (.37). In addition, more students with severe mental retardation (.26) used gestures and vocalizations to communicate than did their peers with profound mental retardation (.13). Speech and sign language, which reflect the more symbolic and conventional forms of expression, were identified as the primary forms of expression for .12 of individuals with severe mental retardation but only .03 of those with profound mental retardation.

A second analysis using the chi-square test indicated that the distributions of Communication Profiles were significantly different for individuals with severe versus profound mental retardation ($X^2 = 25.03$, $p < .001$). Figure 2 shows that within the subgroup of students with severe mental retardation, there was a wide spectrum of Communication Profiles, which ranged from II to VII. In contrast, the range of Communication Profiles, I to IV, observed among individuals with profound mental retardation were more narrowly distributed. Communication Profiles III and IV were the most frequently associated profiles for students with severe disabilities (.71), whereas Profiles II and III were most frequently related to students with profound mental retardation (.58). A relatively large proportion of students

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ting up formal assessment tasks with expected responses. As students with severe cognitive disabilities are increasingly involved in inclusive school and community programs, the use of such naturalistic measures may be especially important to examine qualities of social interaction across environments.

There may also be close correspondence between Communication Profiles and the sets of intervention goals that might be considered for students within profiles. For example, for students whose skills are characterized by Communication Profile II, goals might focus on the student: developing anticipatory behaviors to familiar events, routines, and activities; providing deliberate responses to others' initiations of social interaction; or learning specific behaviors to request specific objects or persons. For Communication Profile V, goals might be to: promote the combination of symbols to create two-word sentences; increase one's ability to initiate and engage in short exchanges with others; and expand one's functional vocabulary using conventional symbols. It is not presumed here that these profiles provide an exhaustive description of communication skills and behaviors, or suggest the unique intervention goals best suited to particular individuals. However, they can provide some direction to educators who seek to interpret qualities of their students' behaviors in order to formulate meaningful communication goals, intervention strategies, and activities. Future research efforts might be directed toward adapting and validating the Communication Profiles as a cohesive assessment protocol for use by practitioners working with students who have severe communicative and cognitive disabilities, and examining how individuals' communication forms and patterns are influenced by social environmental factors.

References

Bricker, D. (1992). The changing nature of communication and language intervenuon. In S. Warren & J. Reichle (Eds.), *Communication and language intervention: Vol. 1. Causes and effects in communication and language intervention* (pp. 361–375). Baltimore: Paul H. Brookes.

Carr, E. G., & Durand, M. (1985). Reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis*, 111–126.

Carter, M., Hotchkis, G. D., & Cassar, M. C. (19 Spontaneity of augmentative and alternative c munication in persons with intellectual disa ties: Critical review. *Augmentative and Altern Communication, 12*, 97–109.

Cirrin, F. M., & Rowland, C. M. (1985). Comm cative assessment of nonverbal youths with vere/profound mental retardation. *Mental R dation, 23*, 52–62.

Donnellan, A. M., Mirenda, P. L., Mesaros, R. A Fassbender, L. L. (1984). Analyzing the com nicative functions of aberrant behavior. *Journ the Association for Persons with Severe Handicap* 201–212.

Franklin, K., Mirenda, P., & Phillips, G. (19 Comparisons of five symbol assessment proto with nondisabled preschoolers and learners severe intellectual disabilities. *Augmentative Alternative Communication, 12*, 63–77.

Kaiser, A. P. (1993). Introduction: Enhancing dren's social communication. In A. P. Kais D. B. Gray (Eds.), *Communication and lan intervention: Vol. 2. Enhancing children's comm tion: Research foundations for intervention*, (pp. Baltimore: Paul H. Brookes.

McLean, J. E., & Snyder-McLean, L. (1988). A cation of pragmatics to severely mentally reta children and youth. In R. L. Schiefelbusch & Lloyd (Eds.), *Language perspectives: Acquisitio tardation, and intervention* (2nd ed., pp. 255–: Austin, TX: Pro-Ed.

Reichle, J. (1991). Defining the decisions inv in designing and implemenung augment and alternative communication systems. Reichle, J. York, & J. Sigafoos (Eds.), *Implem augmentative and alternative communication: S gies for learners with severe disabilities* (pp. 59 Baltimore: Paul H. Brookes.

Reichle, J., Halle, J., & Johnston, S. (1993). I oping an initial communicative repertoire: A cauons and issues for persons with severe di ities. In A. P. Kaiser & D. B. Gray (I *Communication and language intervention: V Enhancing children's communication: Research dations for intervention* (pp. 105–136). Balti Paul H. Brookes.

Reichle, J., York, J., & Sigafoos, J. (Eds.) (1 *Implementing augmentative and alternative com cation: Strategies for learners with severe disab* Baltimore: Paul H. Brookes.

Romski, M. A., & Sevcik, R.A. (1992). Devel augmented language in children with s mental retardation. In S. Warren & J. Re (Eds.), *Communication and language interv Vol. 1. Causes and effects in communication an*

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guage intervention (pp. 113–130). Baltimore: Paul H. Brookes.

Romski, M. A., Sevcik, R. A., Reumann, R., & Pate, J. L. (1989). Youngsters with moderate or severe mental retardation and severe spoken language impairments I: Extant communicative patterns. *Journal of Speech and Hearing Disorders, 54,* 366–373.

Rowland, C., & Stremel-Campbell, K. (1987). Share and share alike: Conventional gestures to emergent language for learners with sensory impairments. In L. Goetz, D. Guess, & K. Stremel-Campbell (Eds.), *Innovative program design for individuals with dual sensory impairments* (pp. 49–75). Baltimore: Paul Brookes.

Sigafoos, J., Cole, D. A., & McQuarter, R. J. (1987). Current practices in the assessment of students with severe handicaps. *Journal of the Association for Persons with Severe Handicaps, 12,* 264–273.

Stillman, R. (1993). Communication: Presentation. In J.W. Reiman & P.A. Johnson (Eds.), *Proceedings of the National Symposium on Children and Youth Who Deaf-Blind* (pp. 129–139). (Available from Teaching Research Publications, 345 N. Monmouth Ave., Monmouth, OR 97361.)

Stillman, R., & Battle, C. (1985). *The Callier Azusa Scale-H: Cognition and communication.* Dallas, TX: University of Texas at Dallas.

Stillman, R., & Siegel-Causey, E. (1989). Introduction to nonsymbolic communication. In E. Siegel-Causey & D. Guess (Eds.), *Enhancing nonsymbolic communication interactions among learners with severe disabilities* (pp. 2–12). Baltimore: Paul H. Brookes.

Wetherby, A. M., & Prizant, B. M. (1992). Profiling young children's communicative competence. In S. F. Warren & J. Reichle (Eds.), *Communication and language intervention: Vol. 1. Causes and effects in communication and language intervention* (pp. 217–253). Baltimore: Paul H. Brookes.

Wetherby, A. M., Yonclas, D. G., & Bryan, A. A. (1989). Communication profiles of preschool children with handicaps: Implications for early identification. *Journal of Speech and Hearing Disorders, 54,* 148–158.

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Appendix B:

Dimensions of Communication
Part I: Developing a Communication Profile
Part II: Designing an Intervention Plan
Recording Booklet